Model Assessment
Hazardous Substances Policy - Assessment

CHEMICAL HAZARD AND RISK ASSESSMENT

School/Dept: Metallurgy and Materials
Assessment Number: XXXXXXXX
Assessor: AN Other
Date of Assessment: XX/XX/XXXX

Notes: Guidance on making an assessment is given in Chemical Hazard and Risk Assessment (GUIDANCE/22/CHRA/05). Guidance is also available from the attached Guidance on Completing the Chemical Hazard and Risk Assessment Form. Substance data is available in HAZDAT. Use a continuation sheet or word processor to expand any section of this form. An MS Word file for this form is available from http://www.hsu.bham.ac.uk/univ/hspolicy/hs15/HS2ASSFM.DOC.

1 | LOCATION OF THE WORK ACTIVITY
Cast Metals Laboratory, SG22

2 | PERSONS WHO MAY BE AT RISK
List names where possible: AN Other1 AN Other2, undergraduates and Postgraduates

3 | ACTIVITY ASSESSED
Production of sand moulds for foundry use

4 | MATERIALS INVOLVED
Attach copies of data sheet(s)

<table>
<thead>
<tr>
<th>NAME and CAS NUMBER</th>
<th>AMOUNT and FORM</th>
<th>HAZARD</th>
<th>RISK PHRASES</th>
<th>REPORTABLE?</th>
</tr>
</thead>
</table>
| Silica sand         | 98.8% solid 0.6% liquid | Flammable | Flammable
|                     |                  | Harmful | Harmful: may cause lung damage if swallowed. |
|                     |                  | Irritant | Irritating to respiratory system. |
|                     |                  |         | Repeated exposure may cause skin dryness or cracking. |
|                     |                  |         | Vapours may cause drowsiness and dizziness. |
| Pepset 5112 (polymer-polyols (35-50%) in trimethyl benzene) | 0.6% liquid | Flammable | Flammable |
|                     |                  | Harmful | Harmful by inhalation |
|                     |                  | Irritant | Irritating to eyes, respiratory system and skin |
|                     |                  |         | May cause sensitisation by inhalation and skin contact |
|                     |                  | Dangerous for the Environment | Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| Pepset 5230 Diphenylmethane diisocyanate (60-80%) in High boiling aromatic solvent 101-68-8 | 0.6% liquid | Flammable | Flammable |
|                     |                  | Harmful | Harmful by inhalation |
|                     |                  | Irritant | Irritating to eyes, respiratory system and skin |
|                     |                  |         | May cause sensitisation by inhalation and skin contact |
|                     |                  | Dangerous for the Environment | Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |

If substance is reportable, have you reported it to the Health and Safety Unit? YES/NO (see Note 4)

5 | INTENDED USE and JUSTIFICATION (where appropriate)
Production of resin bonded sand moulds for foundry use. 0.6% Pepset 5112 +0.6% Pepset 5230 + sand mixed in Fordath mixer. Mixture hand tucked into patterns. All done at room temperature

6 | RISKS to HEALTH and SAFETY from INTENDED USE
From personal exposure or hazardous reactions. Refer to WELs, flash points, etc., as appropriate. Are pregnant women, breast-feeding mothers especially at risk?
Silica sand is free of respirable silica but may produce respirable silica in use if abraded.
Pepset 5112, OES=25ppm= 14.2cm³ liquid (= 3.7kg sand) per 100m³ air, Bp 147°. Significant exposure only if sand exceeds 3.7kg. Risk of skin contact when handling.
Flashpoint 43°, well above room temperature, negligible risk of ignitable atmosphere at room temperature.
**Model Assessment**

Pepset 5230, OES=0.02mg/m³ (isocyanate) 500mg/m³ (solvent = 50g (= 8kg sand)per 100m³ air). Sensitiser by inhalation and skin contact. MDI is a solid and has a very low vapour pressure, therefore, significant airborne exposures to MDI from solution are unlikely to occur at room temperature. Significant exposure to solvent only if sand exceeds 8kg. Significant risk from skin contact when handling.

Flashpoint >41°C, well above room temperature, negligible risk of ignitable atmosphere at room temperature.

### 7 CONCLUSIONS ABOUT RISKS

Is level of risk acceptable? Can risk be prevented or reduced by change of substance/procedure? Are control measures necessary?

- Minimal risk by inhalation of Pepset components – but extract ventilation as a precaution for sensitiser and essential for amounts of resin = sand quantity > 8kg.
- Minimal risk of exposure to respirable silica if sand handled gently.
- Unacceptable risk by skin contact with resin

### 8 CONTROL MEASURES

Additional to Good Chemical Practice, e.g., fume cupboard, etc. Any special requirements, e.g., glove type, etc.

- Gentle handling of sand to minimise dust production.
- Mixing and moulding to be done under custom extraction in foundry. Hand and eye protection needed PE/EVAL/PE gloves.

### 9 INSTRUCTION/TRAINING

Specify course(s) and/or special arrangements.

- Chemical safety course. Use of extract hoods and mixer.

### 10 MONITORING

Performance of control measures, air velocity of extraction hood and bench

<table>
<thead>
<tr>
<th>Personal exposure</th>
<th>Health Surveillance, specify measures agreed with Health and Safety Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>No excess exposure anticipated with control measures</td>
<td>Report to Occupational Health</td>
</tr>
<tr>
<td></td>
<td>Inspect skin for rashes</td>
</tr>
<tr>
<td></td>
<td>Measure lung function</td>
</tr>
</tbody>
</table>

### 11 WASTE DISPOSAL PROCEDURE

Include name, 6-digit code and H numbers if to be sent away for disposal

- Unreacted resin components - hazardous waste H3/H5 10 10 13
- Used sand - trade waste

### 12 REVIEW

Enter the date or circumstances for review of assessment (maximum review interval 5 years)

- Annual

### 13 EMERGENCY ACTION

#### TO CONTROL HAZARDS

To stabilise situation eg spread absorbent on liquid spill; eliminate sources of ignition, etc.

- Use spill absorbent to prevent spread of liquid

#### TO PROTECT PERSONNEL

- Evacuation, protection for personnel involved in clean-up, Special First Aid
- Eye and hand protection (PE/EVAL/PE gloves). Full face mask with AP3 filter.
- Standard first aid

#### TO RENDER SITE OF EMERGENCY SAFE

- Pepset 5112 collect with inert absorbent. Wash site of spillage thoroughly with water. Ventilate
- Pepset 5230 Treat with aqueous sodium carbonate (5-10%)/liquid detergent (0.2-0.5%). Collect with inert absorbent. Ventilate

### 14 EMERGENCY CONTACT

<table>
<thead>
<tr>
<th>NAME</th>
<th>PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN Other</td>
<td>XXXXX</td>
</tr>
</tbody>
</table>
